No. 864,981. PATENTED SEPT. 3, 1907.

E. F. McCARTHY.

TOOL.

APPLICATION FILED SEPT. 11, 1906.

2 SHEETS—SHEET 1.

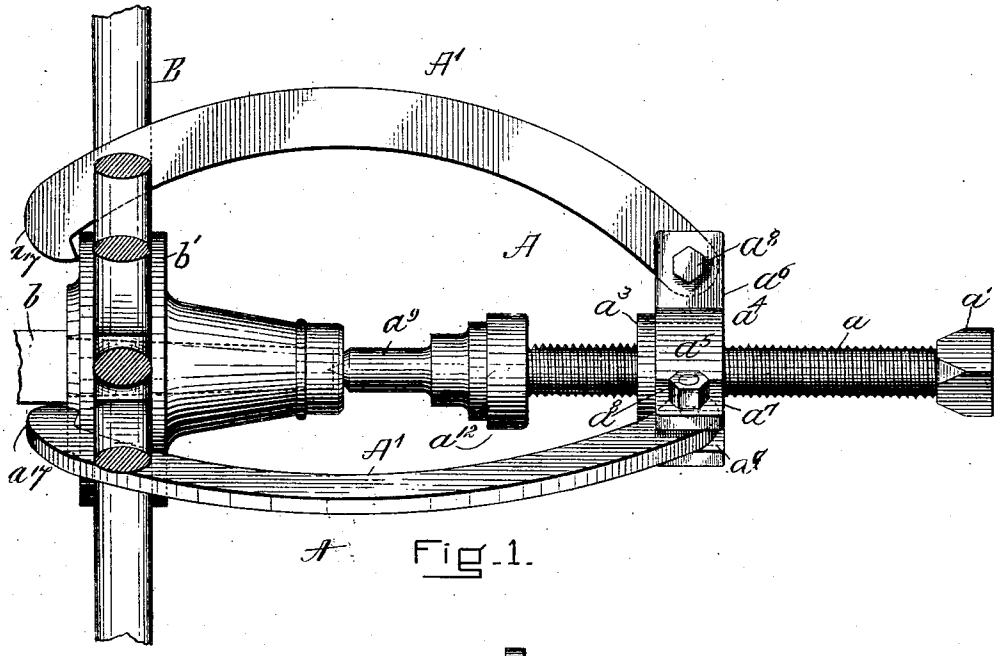


Fig. 1.

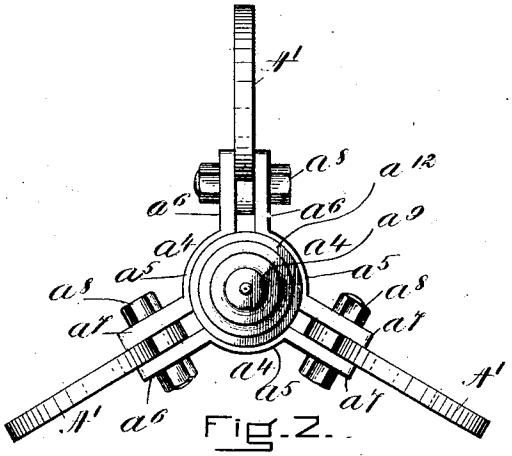


Fig. 2.

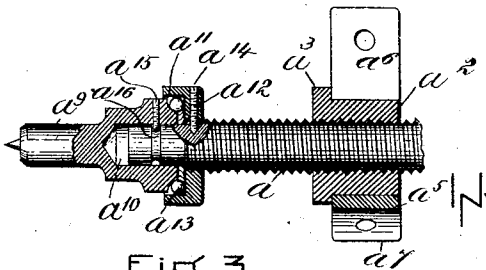


Fig. 3.

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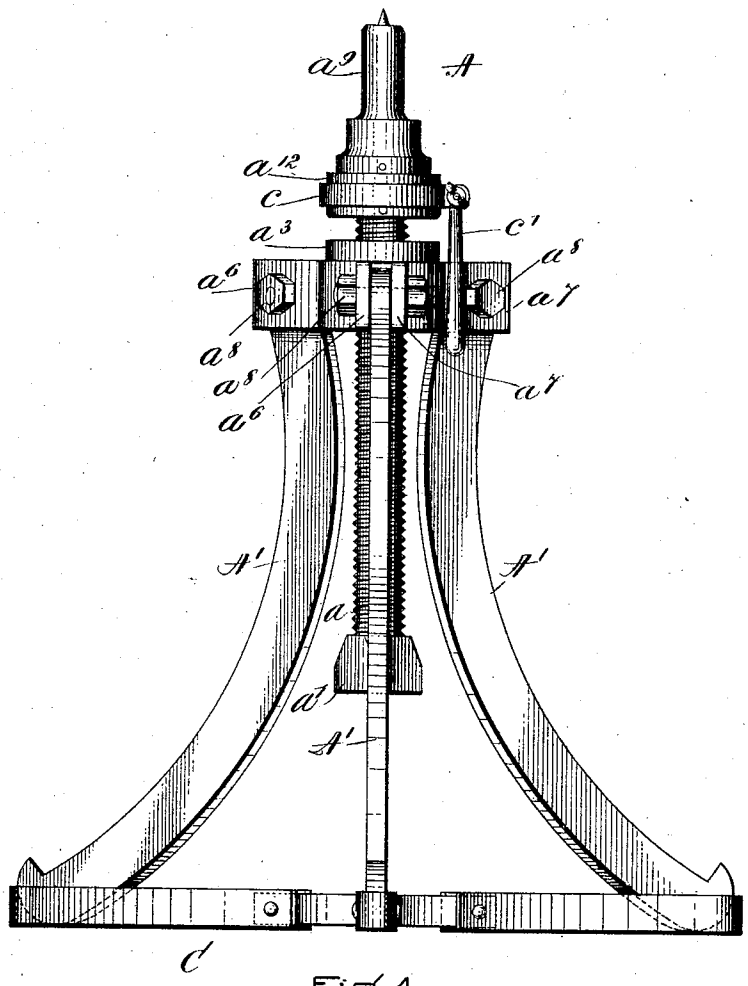


Fig. 4.

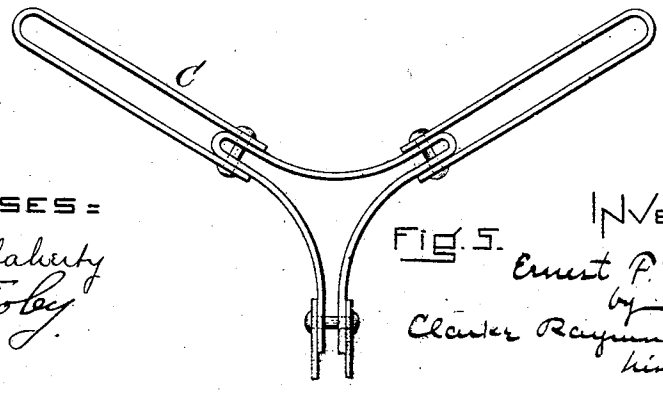


Fig. 5.

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UNITED STATES PATENT OFFICE.

ERNEST F. McCARTHY, OF MELROSE, MASSACHUSETTS.

TOOL.

No. 864,981. Specification of Letters Patent. Patented Sept. 3, 1907.

Application filed September 11, 1906. Serial No. 334,200.

To all whom it may concern:

Be it known that I, ERNEST F. McCARTHY, of Melrose, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Tools, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to an improved tool or device for drawing pulleys, wheels or other parts from a shaft on which they have become stuck, which device, also, is capable of being converted into a jack.

The object of my invention is to provide a handy tool especially designed for automobile repair work by which a wheel of an automobile may be drawn from its shaft without injuring the end of the shaft; also, a tool which will be held self-centered upon the end of the shaft.

Difficulty has before been encountered in wheel-pulling tools in that their use tended to injure the end of the shaft in conjunction with which they were used by upsetting the same. Further difficulty has been encountered by reason of the fact that the tool was not held self-centered against the end of the shaft against which it had its bearing and accordingly had the tendency to slip off the same.

By my invention I have provided a tool that will not upset the end of a shaft in connection with which it is used, and is held self-centered upon the same; providing, also, a tool which is easily operable and one, also, which can readily be converted into a jack, as will hereinafter be explained.

Referring to the drawings:—Figure 1 shows the device and a portion of a wheel to which the device is applied, in side elevation. Fig. 2 is a plan of the device. Fig. 3 is a longitudinal cross section of a portion thereof to which reference will hereinafter be made. Fig. 4 shows in side elevation the device converted into a jack, and Fig. 5 shows in plan a portion of a rack used in the conversion of the device into a jack.

In the drawings:—A represents the tool or device and B a portion of a wheel to which the tool is applied, as showing its method of usage, as will hereinafter be explained.

The tool comprises a threaded member or screw a. This is provided on its end with a head a^1 adapted to receive a wrench or other instrument by which the screw may be turned. On the screw is arranged a traveling nut a^2 provided with an annular flange a^3. Having bearing against this flange and clamped around the body of the nut are a series of pieces a^4 carrying the gripping arms A^1. Each of these pieces comprises a portion a^5 which fits around the body of the nut and bears against its annular flange as aforesaid. From the ends of these portions a^5 of the respective pieces there project out-turned flanges a^6 and a^7. The size and disposition of the pieces a^4 is such that when the pieces are in proper place the flanges of adjacent pieces will be spaced from one another so as to receive between them the ends of the gripping arms A^1, the arms being secured to the flanges of the pieces and the pieces themselves being secured together to hug the nut around which they are placed as aforesaid by means of bolts a^8 which pass through the flanges and the ends of the gripping arms interposed between them.

The rotary screw a is provided on its end opposite the head thereof with a foot or member a^9 which is adapted to bear against the end of a shaft or other fixture of bearing in the operation of the device, as will be hereinafter explained. The base portion of this foot is provided with an increased thickness of metal and in it is formed a socket a^{10} into which the end of the screw a is adapted to be inserted. The screw a makes a ball-bearing connection with the foot a^9 whereby in the operation of the device the screw may turn upon the foot by reason of the ball portion of the bearing interposed between the parts thereof.

The bearing is made in the following manner:—The part a^{11} of the base portion of the foot is incised to form one member of the bearing and a cup-shaped nut a^{12} threaded upon the screw a, the other portion thereof. Balls a^{13} are interposed between the separate parts of the bearing. The nut a^{12} is keyed to the screw by means of a threaded pin a^{14} passing through the nut and into the side of the screw. For the purpose of preventing the foot from slipping off the end of the screw there is passed through the base portion thereof a threaded pin a^{15} which fits into an annular slot a^{16} formed in the end of the screw a or in that portion thereof which fits into the socket formed in the base portion of the foot, as was before explained. This permits of the screw turning upon the foot, but prevents the parts from being drawn apart in a longitudinal direction.

As will be noted the gripping arms A^1 are curved and on their ends are formed hooks a^{17} by which the arms may catch onto or grip the object to be operated upon.

The manner of operating the device is as follows:—Referring to Fig. 1, it will be noted that the foot of the screw a is placed against the shaft b from which the wheel is to be drawn. The arms A^1 are then interposed between the spokes of the wheel and caught onto the hub portion thereof b^1. Then by turning the screw a by a wrench applied to its head the screw will turn on the foot a^9, which bears against the end of the shaft as aforesaid, said foot being non-rotatable. With the turning of the screw the traveling nut a^2 will travel back along the same and by means of the connecting arms will draw the wheel from the shaft.

Inasmuch as in the operation of the device the part or foot which bears against the end of the shaft does not turn, the danger of its boring into the shaft or other-

wise upsetting the same is eliminated. The number and arrangement of the gripping arms is also to be noted, three arms preferably being employed. In other words, more than two arms are provided in order that the object operated upon may be grasped at more than two points whereby said device will be self-sustaining in an operative position with the end of the shaft in connection with which it is used, as distinguished from that kind of a device in which only two arms are employed and which device, unless held in place by the operator, is very apt to become disconnected from the end of the shaft.

In Fig. 4 the tool or device is shown converted into a jack. This is primarily accomplished by turning back the gripping arms in a direction away from the foot of the screw and into a position where they may rest upon some base or support. They are held in this position by means of a slotted rack C in which the ends of the arms are adapted to be contained. Then around the nut a^{12}, fixed to the screw a as aforesaid, is clamped a collar c to which is secured an operating lever c^1 by which the screw is turned. In the operation of the device as a jack, the foot a^9 is placed beneath the object to be raised or lowered when upon turning the screw through the instrumentality of the operating lever c^1 the object is raised or lowered as may be desired. During this operation the foot which engages with the object does not turn, while the screw a turns upon the foot or ball-bearing interposed between the foot and the screw in the manner substantially as before explained.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States:—

1. A tool of the character specified having in combination a screw, a traveling member thereon, gripping arms connecting with said member, a foot to said screw, and means forming an antifriction bearing between said foot and screw whereby the said screw may turn on said bearing independently of said foot.

2. A tool of the character specified having in combination a screw, a traveling member thereon, gripping arms connecting with said member, a foot to said screw a portion of which forms one part of a bearing, a threaded nut on said screw forming the other portion of said bearing, and balls interposed between the same.

3. A tool of the character specified having in combination a screw, a traveling member thereon, gripping arms connecting with said member, a foot to said screw having a socket in the base portion thereof in which the end of the screw is adapted to be contained and which base portion is incised to form one portion of a bearing, a cup-shaped nut threaded on said screw forming the other portion of said bearing, means fixing said nut to said screw, balls interposed between the two parts of said bearing, and a pin extending through the base portion of said foot and contained in an annular groove in the end of said screw, substantially as described.

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